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Contested Terrain: three battlefields in which to study the digital economy

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This is a background paper for the workshop, "Work in the digital age: the challenge of platform firms" jointly hosted by the Hertie School and the Berkeley Roundtable on the International Economy. The workshop will take place on March 16, 17, and 24, 2021. If you would like to attend the workshop, please email Dafna Bearson at dafnabearson@berkeley.edu.

Contested Terrain: three battlefields in which to study the digital economy

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Abstract: The increasing dissemination of digital tools and the establishment of a digital infrastructure have sparked a transformation towards digital economies, a central feature of which are platforms. Premised upon network effects and the control of the flow of information converted into data points, they have become a disruptive force in the business landscape. Distinguishing between infrastructure and sectoral platforms, we show that the current trajectory of digital transformation is dominated by big tech companies because they both provide and control the digital infrastructure. However, the current trajectory is not inevitable, and different regulatory and business models are possible. We analyse three key battlefields that will decide the future of the digital economy: (1) Growth trajectories, (2) the regulation of infrastructure platforms and (3) the debate over employment and labour standards.

1. Introduction

In October 2020, the US House Judiciary Committee published a majority staff report on its investigation into competition in digital markets. The report accuses Apple, Amazon, Alphabet (Google parent company) and Facebook of anticompetitive behaviour (Nadler et al. 2020). Two of the key complaints of the report are the abuse of market dominance, leading to a preference for their own products, and the acquisition of competitors, to control the market. The report chimes in with several reports and calls for statutory competition law reform and changes to the current regulatory practices of big tech companies. This includes, for instance, a call by Democratic senator Elisabeth Warren to pass legislation that requires large tech platforms to be designated as "Platform Utilities" and broken apart from any participant on that platform as well as the reversal of illegal and anticompetitive tech mergers (Warren 2019). Also in October 2020, the Department of Justice sued Google for violating competition law by paying other companies to preference Google Search (DOJ 2020). Complaints included paying mobile phone companies, carriers and browsers to make Google Search their default search engine and banning Android phone manufacturers from pre-installing any other search engines. The lawsuit is co-signed by the attorneys general of 11 states with Republican governments – other attorneys general investigating Google did not co-sign, but have stated that they support the suit and that, if they bring their own suits against Google, they will apply to have the cases consolidated. There are more ongoing

investigations into Google's advertising practices. On 10 November 2020, the EU Commission issued competition complaints against Amazon for violating competition law by exploiting third-party seller data to give its own products an advantage (European Commission 2020). The investigation was launched in 2019. The European Commission simultaneously announced the launch of a new investigation into Amazon's use of its Buy Box and Prime programmes to push third-party sellers into using Amazon's logistics services.

These are only the most recent cases of attempts by policymakers and regulators to reign in the market power of big tech companies. Power and governance in the digital economy are squarely on the agenda of today's politics. As digital tools have taken over our day-to-day life by making modern life almost impossible without access to the internet, to Microsoft or Apple products and without smartphones, the question of who governs our economies becomes more and more pressing.

Even though the comparative political economy research community has always had a strong interest in the transformation of capitalism, the role of the digital economy in that transformation has not attracted much attention up to now. The knowledge-based economy, as a broader term, has been used in some parts of the literature to analyse the rise of the service economy and its political implications (Beramendi et al. 2015; Hall 2020; Wren 2013; Hassel and Palier 2021). However, the underlying understanding of the knowledge economy's economic model is often crude and not based on the substantial research of digital tools and technology itself. Structural shifts in the labour market from manufacturing to service sector jobs and the perception of social risks and vulnerabilities are usually used to make assumptions about political behaviour (Kurer & Palier 2019). This is also the case for large parts of the research into labour economics, which rely heavily on the structural shifts of the composition of occupations and tasks, and the effects on labour market status and incomes (Autor & Salomon 2019; Goos et al. 2013).

Only a few scholars in political science have started to address the nature of the digital economy head on (Rahman & Thelen 2019; Thelen 2018; Culpepper & Thelen 2019; Kenney and Zysman 2016). However, business studies literature has discussed new platform-based business models for at least a decade and has focused much more intensely on the

reconceptualization of platform-based business models, with a particular focus on innovation (Gawer 2014; Fehrer et al. 2018). The digital economy has raised concern amongst competition lawyers, who aim to assess the potential for anti-trust cases (Bamberger & Lobel 2017).

The lack of attention in political science is also in contrast to the profound effects of the digital economy, not only in our private lives but also in the public discourse. Here, the expectations are that digitalization will lead to the fundamental transformation of national economies. As Breznitz et al (2011, 204) point out: ICT causes the "re-structuring of industries, businesses, and institutions in a way similar to the previous major general-purpose technologies, namely steam and electricity". If this is the case, the likely impact on societies is enormous and much broader than the current discussions on the gig economy in political science and the research on automation and digitalization in labour economics suggest (Crouch 2019; Autor & Salomons 2018). This restructuring is still in full swing. We do not know what the endpoint of the transformation is nor how far along we are in the restructuring of industries. Big tech companies continuously drive the transition towards new patterns of consumer behaviour, business models, work organization and infrastructure at great speed (Browne 2018).

In the following, we sketch the fundamentals of the digital economy and the significance of big tech and platforms for the study of the political economy of industrialized countries. We identify the main mechanisms, namely network effects and the control of the flow of information converted into data points, which lead and foster market domination, corporate concentration and power at an unprecedented level for the tech industry. We analyse the implications for the study of the digital economy in the fields of growth, regulation and employment. Finally, we analyse the lines of battle with regulators more closely and discuss the options for reigning in big tech companies. The contestation between the business behaviour of big tech firms and regulators is at the heart of the institutionalization of the digital economy and has far-reaching consequences.

2. Features of the digital economy

At the centre of the current pattern of transformation towards the digital economy are big US and Chinese tech companies which, in one form or other, use or benefit from platform business models to monopolize markets and to establish market and political power and control. Platforms have become the central way of organizing interactions and relationships between large numbers of users. Platform firms combine the digital infrastructure, computational prowess as well as financial and political power to reorganize entire sectors. Platforms are digital intermediaries operating in two- or multi-sided markets that guarantee a free interaction of demand and supply (Rochet & Tirole 2003). Two central characteristics explain the power of platform firms: (1) network effects and (2) controlling the flow of information that is converted into data points and commodified. Network effects can either be of a direct or indirect nature. Direct or same side network effects refer to the value derived from the platform, depending on the number of other users on the same side of the platform, such as social media platforms, whose value increases for users when the number of users grows (Parker et al. 2017). This effect is further reinforced if technical restrictions prohibit the use of multiple platforms, also known as multi-homing (Jacobides et al. 2018). This lack of interoperability and its importance for the power of platforms can be illustrated when comparing mobile calling with mobile messenger apps. Whereas it is possible to call any mobile phone regardless of the network provider or device manufacturer, mobile messenger apps, such as WhatsApp, do not allow messages to come from or go to other apps, which further strengthens their direct network effects. Indirect or cross-side network effects refer to the value derived from a platform depending on the number of users on the other side of the platform (Gawer 2014). Google becomes more valuable for advertising the more users the service attracts. Similarly, Amazon's marketplace becomes valuable to third-party sellers depending on the number of users already participating on the platform. Network effects are powerful because they entail almost zero marginal costs and demand-side economies of scale, implying that their utility for users increases with scale (Jacobides et al. 2018). This stands in contrast to firms, which focus on tangible assets, such as manufacturing firms with higher marginal costs and supply-side economies of scale, which imply that scale leads to a lower cost per unit.

The second central characteristic explaining the power of platforms is the control and commodification of the flow of information. Each online activity or piece of information is translated into a data point and hence made computable. These data points are then commodified to run ads and used by the platform to improve the service they provide. Consumers take a central part in this process, as they provide the information and are compensated by being able to use the platform service for free. Platforms, thus, co-create value with users, which is a deeper reflection of the incremental shift from tangible assets, in which value is created by the firm, to intangible assets, where value co-creation dominates (Lusch & Vargo 2014). Even though consumers are compensated by being able to use the platform service for free, the value of their information is substantial. In a 2019 study, the economic advisory firm Sonecon estimated the market value not only of large platform firms but also credit card and healthcare companies derives from mining personal data in the United States. According to their estimates, this data was worth 76 billion dollars in 2018, which is an increase of 45% from 2016 (Shapiro & Aneja 2019).

A central feature of platform firms is, therefore, unprecedented value capture, as value is co-created with users but primarily extracted by platforms. The flow of information converted into data is, however, not only commodified but also used to fuel the network effect. Amazon and Google use their data to optimize their algorithms and present their users with products or search results that are closer to their preferences. If a competing firm wants to enter the market, it must offer either lower prices or a have a higher value proposition. Under the conditions of network effects, it becomes increasingly difficult because services are provided for free and the constant flow of information increases the value proposition of incumbents. Thus, upfront investments to build a similar customer base are extremely high.

2.1 The digital economy and the model of the firm

Platform firms have become a disruptive force in the business landscape. However, they do not constitute an entirely new model of the firm but rather share features of previous ones, as already shown in political economy research and organization theory (Weil 2014; Davis

2016; Culpepper & Thelen 2019) (table 1). For much of the 20th century, the vertically integrated firm, represented, for instance, by large manufacturing firms such as General Electric, was the dominating firm model. One of the main characteristics of the vertically integrated firm was that the maintenance of employment relations was executed directly within the boundaries of single firms, resulting in a wide dissemination of permanent employment contracts distributed among a large workforce (Lazonick 2010). Due to encompassing regulation, the vertically integrated firm exercised strong control over employment conditions and could assure high-quality standards. Similarly, the vertically integrated firm was characterized by a centralized form of coordination. The motivation behind regulated employment relationships within the boundary of the firm was to coordinate and integrate facilities and skills into one unified organization focused on long-term growth (Lazonick 2010). Patient capital was essential to achieve this growth pattern that guaranteed the continuous and stable growth of these companies. These features were also reflected in the political coalition that supported the vertically integrated firm. This traditional firm model was especially sustained by a coalition of managers and stakeholders, including labour, that was committed to long-term growth and employment security (Rahman & Thelen 2019).

Table 1: Theories of firms and employment effects

Types of firms	Vertically integrated firm	Firm as a nexus of contracts	Platform firms as critical market creators
Capital	Patient capital	Impatient capital	Patient capital
Political coalitions	Managers and stakeholders including labour	Managers and investors	Investors / firm owners and consumers
Network effects	Non-essential	Non-essential	Essential
Dominant employment	Regulated employment relationships within the boundary of the firm	Subcontracting and outsourcing of non-essential auxiliary services	Genius workers and independent contractors
Effects on work	Encompassing regulation, job security	Insider-outsider distinction	Tasks rather than job-based work and extreme polarization within the firm
Control over employment	Direct bureaucratic control	Guidelines, incentives	Algorithmic management
Examples	Manufacturing firms until 1980s (General Motors)	Consumer goods manufacturing (Nike)	Platform firms (Amazon, Facebook)

Source: Own table based on Weil (2014), Davis (2016) and Culpepper & Thelen (2019)

The role of the vertically integrated firm has started to decline since the mid-1980s. This decline was the result of several, mutually dependent forces. Advances in technology played an important role, as they facilitated the communication and monitoring of third parties (Weil 2014). In the past, the outsourcing of production and employment was associated with lower efficiency due to information asymmetries. Improved communication and monitoring alleviated such concerns and facilitated outsourcing processes. Hence, companies were able to reap the benefits of outsourcing production and employment while maintaining service and product quality (Weil 2014). Increasing pressure from capital markets to reduce costs and a shift of relative power from labour to capital also pushed companies towards outsourcing. The growth of private equity contributed especially to this development and made many companies focus more on short-term shareholder profits instead of long-term productivity growth (Weil 2014; Bernhardt et al. 2016). In conjunction with reduced coordination costs, this process led firms to focus on their core competencies, whilst outsourcing other production activities, previously maintained within the boundaries of the firm, in order to

improve competitiveness (Wilmers 2018). These processes were accompanied by declining antitrust enforcement, particularly in the United States, which contributed to increased industry concentration and higher inter-firm inequality.

As a consequence, the vertically integrated firm was increasingly replaced by a model of the firm as a nexus of contracts (NOC), which still shapes the business landscape today (Jensen and Meckling 1976; Rahman & Thelen 2019). A key characteristic of the nexus of contracts model is a focus on core competencies, driven by powerful shareholder interests and impatient capital directed towards profit maximization. Jobs that fell outside the realm of the core competencies were outsourced and ever more complex employment networks, involving subsidiaries and subcontractors, were developed (Rahman & Thelen 2019). These employment practices were labelled Nikefication, as a reference to the apparel company's practice of outsourcing almost every task except for design and marketing functions, which were considered to be core competencies (Davis 2016). The focus on core competencies in conjunction with outsourcing resulted in a strong insider-outsider distinction. Those employees, who were directly employed by the firm, enjoyed much better employment conditions than the employees hired by subcontractors. Instead of exercising control via vertical integration, the nexus of contracts model relied on a mix of direct bureaucratic control and market mechanisms. Since the workforce is highly fragmented, NOC firms face the challenge of assuring a sufficient standard of quality. In order to achieve effective quality assurance, these firms organize their workforce by relying on guidelines and incentives. Driven by the growing importance of shareholder value, the political coalition that supports the NOC model no longer includes workers, but is rather composed of investors and managers, whose strategies centre around short-term growth, outsourcing and asset stripping (Rahman & Thelen 2019).

Platform firms went beyond the firm as a nexus of contracts, as they focus on data harnessing and demand economies of scale driven business models that aim for market dominance through network effects. However, the employment model of platform firms shows certain similarities to the nexus of contracts model. Similar to the nexus of contracts model, platforms focus on core competencies and outsource all those part of production that are deemed non-essential. This outsourcing and subcontracting creates a two-tier labour market

with highly paid workers, often software engineers, directly employed by the platform and a large amount of independent contractors carrying out service-related tasks at the periphery. Control over employment, which is particularly challenged, given the loosely coupled independent contractors, is achieved by algorithmic management, while a coalition between consumers and investors sustains this employment model. Thus, while platform firms share characteristics of the employment model of the nexus of contracts firms, they depart from this firm model in other regards. A central feature platform firms share with the vertically integrated firm is patient capital, which allows them to run deficits and prioritize market expansion over making profits. Unlike vertically integrated firms, this form of patient capital is not utilized to achieve a continuous, steady growth, but rather to pursue winner-take-all strategies. Another feature platform firms share with the vertically integrated firm is vertical integration. Many platform firms contain a complicated organizational structure that goes far beyond one product or service (Wu & Gereffi 2019). This vertically integrated structure of platform firms is best illustrated by Amazon, which is not only a network orchestrator in its function as the platform provider of Amazon Marketplace, but also operates as an asset builder with Amazon Logistics, service provider with its cloud service Amazon Web Services and a technology creator with the virtual assistant Alexa (Wu & Gereffi 2019).

Underwritten by patient capital, a vertically integrated firm structure and dualized internal labour markets, platform firms are, thus, a synthesis of the vertically integrated firm and the nexus of contracts model. Importantly, platforms come in many different forms and functions (Fumagalli et al. 2018; Kenney et al. 2020; van Dijck et al. 2019). They range from advertising platforms, platforms offering cloud services, industrial platforms controlling production or distribution activities, platforms delivering virtual products, work platforms acting as intermediaries for the provision of services and logistics, and marketplace platforms that organize online commerce (Fumagalli et al. 2018). Most importantly, as van Dijck et al. (2019) have shown, there are distinct infrastructure platforms and sectoral platforms.

2.2 Infrastructure and sectoral platforms

To be able to assemble, analyse and share large amounts of data in very little time requires the combination of computational hardware and internet infrastructure, both of which have only become available to mainstream businesses over the last three to four decades. Access to broadband is, therefore, key for the digital economy and has led to debates (and conflicts) over broadband as a utility and the neutrality of the internet.[1]

However, the internet itself is only the landscape of the digital world's virtual reality. Its users need access points, such as search engines, social media platforms and other infrastructure services, to use it effectively. These are currently provided almost exclusively by the seven big tech companies: Alphabet, Apple, Amazon, Facebook, Tencent, Alibaba and Microsoft. These companies operate infrastructure platforms and jointly build an informational ecosystem or an infrastructural core (van Dijck et al. 2019, 12), on which the vast majority of users' interactions takes place. Each of the seven big tech companies provides a number of infrastructural services, which they use to structure and operate the virtual world. For example, Alphabet has a search engine (Google Search), a browser (Chrome), a social network (Google +), an app store (Google Play), a pay service (Google Wallet) and a geo-information system (Google Maps). Similarly, Facebook runs several services platforms, mainly in social media and messaging, and Amazon makes most of its money with cloud services (AWS), but also runs its own marketplace (van Dijck et al. 2019, 13). Alibaba operates a B2B platform (Alibaba.com), a B2C platform (Aliexpress), a pay service (Alipay) and a logistics network (Cainiao), whereas Tencent focuses on social media and entertainment services and runs, among other services, several messaging platforms (WeChat, Tencent QQ). Apple has its app store, i-Tunes and IOS among others, while Microsoft provides Windows, Bing and social platforms such as LinkedIn. Together, these companies and their platforms create the infrastructure of the internet, which, only in combination, enables the full potential of the digital economy. Modern users and businesses rely on most or all of these services in various ways. They are largely interconnected, and interconnectivity and interfaces play a big role for the efficiency of the internet. Infrastructure platforms are multi-sided (and, in principle, open) markets, which users access to exchange information or services. They are the marketplaces of the internet, whereas search engines are the roads

[1] In 2019, the House of Representatives passed the Save the Internet Act to protect net neutrality, which got stuck in the Senate. https://www.nytimes.com/2019/04/10/technology/net-neutrality-vote.html

and other services are the tools that help users find their way around. Cloud services are the general-purpose technologies of the digital economy. All of these services are part of the critical infrastructure, even though they are currently not seen as such.[2]

Sectoral platforms are built on the foundations of infrastructure platforms, such as social media, e-commerce, pay systems and app stores, and have been established to compete directly with traditional businesses or provisions in particular sectors, including public sectors such as education. Examples are the role of Amazon Marketplace in the retail sector and more specifically in the health and pharmacy sector, the role of Facebook for the media industry, and Google's services in schools.

For instance, Amazon launched its own online pharmacy on 17 November 2020, just two years after it took over PillPack, an online delivery service for prescribed drugs (Shieber & Lunden 2020). Amazon customers can not only order drugs online, but they also have access to self-service online advice or can telephone pharmacists to get advice on health issues. It is hard to see how local pharmacies can survive the competition from an online giant.

Google Classroom, Zoom or Microsoft Teams are applications that enable virtual meetings and home schooling. These applications not only impact the transformation and restructuring of business conferences and meetings but also, more specifically, school education and the business models of higher education. Online teaching can only partly replace onsite university teaching but it does so at a much lower cost.

The biggest impact by sectoral platforms can be observed in the media and entertainment industry. Access to media today takes place more through social media than through printed newspapers or television. Facebook and Google control news channels by posting or ignoring news that is published in traditional media outlets. Netflix, Amazon Prime and Disney have taken a big share of the entertainment market.

[2] Critical infrastructure describes the physical and cyber systems and assets that are so vital to a country that their incapacity or destruction would have a debilitating impact on our physical or economic security or public health or safety.

As sectoral platforms are built on the foundations of infrastructural platforms, they exploit the benefits of digital infrastructures to gain competitive advances through indirect network effects and through direct market manipulations, as we will outline below.

2.3 Platform power

The power of the tech companies lies in their ability to combine the control over digital infrastructure with new business models using sectoral platforms and the fact that there is no effective regulation or regulatory oversight. New digital business models need regulatory oversight to ensure fair competition, which is, however, currently missing. The main effects are unfair standards, unfair practices and increasing market concentration. Two channels through which platforms exert their power are according to Khan (2016) (1) predatory pricing and (2) cross-leveraging market advantages. Predatory pricing or below cost pricing is a business strategy often applied by platform firms that aim to dominate the market. Equipped with large sums of venture capital that allows them to prioritise growth over profit, platform firms have an advantage over smaller companies that do not have similar financial means (Khan 2016). Predatory pricing is not exclusively associated with platform firms but occurs particularly in connection with them because of the amount and dissemination of patient capital that permits winner-take-all strategies. The ridesharing platform Uber is involved in several lawsuits alleging that the company is offering its services below cost prices and driving competitors, such as Sidecar, out of business (Stempel 2020). The fact that Uber has never been profitable and reported a loss of 8.5 billion US dollars in 2019, for instance, raised the question as to whether the company will ever be profitable and the sustainability of the business model of labour-related platform firms in general (Hawkins 2020). Not a single one of the food delivery platform firms has ever been profitable, as they, like Uber, subsidize their service and, thus, engage in predatory pricing. These huge losses in the case of ridesharing or food delivery platforms are tolerated by investors because of the promise of achieving market dominance in the future (Parker et al. 2017). However, this is a risky bet, as both ridesharing and food delivery platforms are dependent on manual labour, especially independent contractors, whose wages have to be suppressed in order to achieve market dominance. The success of this strategy depends, to a large extent, on the regulation of

platform-related employment relationships. Particularly in Europe, as we describe below, a shift in regulation towards higher barriers for relying on independent contractors can be observed and could put the sustainability of the platform business model at risk (Risak 2018; Aloisi 2021). Apart from labour dependent ridesharing or food delivery platforms, the big tech platform firms also engage in predatory pricing and hence undermine fair competition. The staff report of the House Judiciary Subcommittee on Antitrust revealed that Amazon was willing to accept 200 million US dollars in losses in a single month to put pressure on their competitor in the baby care market, diapers.com. Diapers.com was unable to provide the same prices, and Amazon eventually bought the parent company Quidsi for 545 million US dollars in 2010 (Nadler et al. 2020).

A key difference between Amazon and ridesharing or food delivery platforms is, however, that Amazon is indeed profitable. Unlike many other platform firms, Amazon is not dependent on external venture capital. The last time the company raised money from investors was in 1997. In fact, since 2002, Amazon has had a positive cash flow and finances new data centres or warehouses from current revenues (Evans 2020). Amazon keeps its profits low, does not pay dividends and reinvests its profits back into the company. It does not cross-subsidize its operations, exclusively using the profits stemming from Amazon Web Services (Evans 2020). In 2015, the company was obliged to disclose its operating income for the first time, going back to 2013 and divided into its segments, AWS, North America operations and international operations, which revealed that not only is AWS highly profitable but so are its entire North America operations. In 2019, Amazon's North America operations generated 7 billion dollars, whereas AWS made a profit of 9.2 billion dollars in operating income. Only the international operations have not yet been profitable and incurred a loss of 1.7 billion US dollars in 2019, as graph 1 shows (Statista 2020).

Graph 1: Annual operating income of Amazon by segment

Source: Statista (2020)

The fact that Amazon is profitable and re-finances its expansion with a positive cash flow stresses that the power of platforms does not always derive from large venture capital funding and investors' insistence on growth over profits, reflected in predatory pricing. A second, major source of platform power is the cross-leveraging of market advantages, which is demonstrated, for instance, by the role of Amazon in both the retail and logistics sector (Khan 2016). Amazon is the largest online retailer, with market shares of 40-50% in the United States and many European countries. Because of its dominant position in the market and its control over the marketplace, Amazon has detailed knowledge about the kind of products it sells, the price range customers are willing to pay, delivery prices and the lowest profit margin third-party sellers are willing to accept before they leave the platform. This combination of control over the digital infrastructure of its marketplace, knowledge of market transactions and logistics operations gives Amazon a competitive edge vis-à-vis stationary retailers who try to set up e-commerce channels, which is almost impossible to beat (Nadler et al. 2020). Cross-leveraging its dominant position in retail and logistics is best illustrated by the Fulfilment By Amazon programme (FBA). Amazon incentivizes its sellers to use FBA by offering them better search results and the Prime label, which guarantees faster delivery and increases demand on the consumer side (Khan 2016). Tying the Amazon Prime label to a participation in FBA can involve anticompetitive practices, when third-party sellers are forced

to use FBA instead of a cheaper delivery option. By forcing third-party sellers to use FBA, Amazon creates its own business in logistics. Moreover, delivery prices are set by Amazon and renegotiation is often to Amazon's advantage, as switching costs for third-party sellers are high since they would lose preferential placement and status on the marketplace platform (Nadler et al. 2020). Precise numbers on the revenues, costs and profits Amazon generates with its FBA programme are, however, not public, as Amazon has refused to disclose these number even to the House Judiciary Antitrust Committee (Subcommittee on Antitrust 2020).

Apart from predatory pricing and cross-leveraging market advantages, platforms act as private regulators, impose unfair standards and thus raise several anti-trust concerns. Private platform providers develop terms and conditions for users who participate in the platform. These terms and conditions generally give the platform providers a free rein to decide who can participate, what kind of behaviour is accepted, the right to monitor users who take part in platforms, and the right to store and use personal data including private information. Cutolo & Kenney (2020) analyse the role of private regulation for business platforms and introduce the concept of platform-dependent entrepreneurs. They argue that they face unique risks due to the huge power imbalance in their relationships with platforms. On the one hand, participation in digital platforms is not optional for many small businesses. For businesses, it is essential to be found through Google Search; similarly, small traders are dependent on Amazon Marketplace; and hotels cannot afford to ignore booking.com. The listing on these platforms depends solely on the rules of the platform. As platforms are only interested in ecosystem participants, who add (economic) value to the ecosystem and the platform, the structure of the platform and its competitive dynamics can push entrepreneurs to pursue goals and strategies, which serve this overarching goal of the platform. Participants also lack key information on competitors, which the platforms themselves have. This information asymmetry led platforms, such as Amazon, to develop competing products based on the sales data obtained exclusively by Amazon, which gives them preferential placement on the marketplace and thus enables them to engage in anticompetitive practices (Nadler et al. 2020). Platforms act (and are expected by ecosystem participants to act) as private regulators of the platform ecosystem, maximising the value of the system, as they own the digital space and have the right to change any of its parameters as they see fit. This power is exercised through code/architecture and by setting rules. It is greater if the

concentration on the platform is greater, which is derived from direct and indirect network effects. Platform providers not only regulate autonomously who can use their services, they also use their own infrastructure to outcompete market participants. The separation between infrastructure and providers, which is standard in utility regulation, does not apply to the digital economy. As a consequence, it is tempting for the infrastructure provider to use its access and data about the use of the infrastructure to gain a competitive edge on the platform.

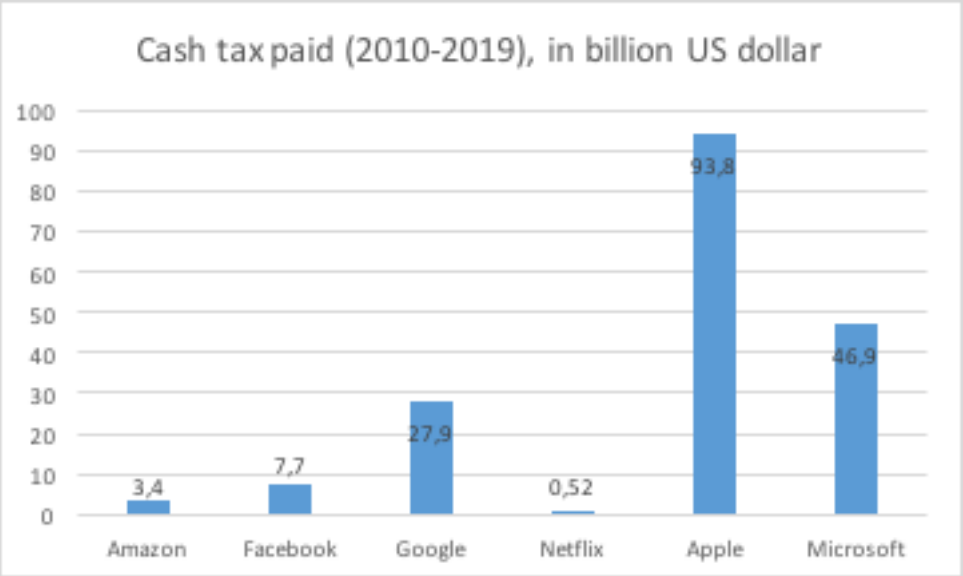
2.4 Other predatory behaviour: hiring talents, tax avoidance, union busting

There are a number of other aspects of how big platform companies exercise power in the digital economy. One is by monopolizing the talent pool of tech experts and creating a dependency of first-class universities on the tech ecosystem. It is well known that platform companies pay experts wages that are four or five times that that established professors of IT or AI can earn at major universities (Ram 2018). Leading researchers train doctoral students and post-docs, who are hired straight away by big platform companies. They also set up their own research departments that offer far better working conditions than either public or private universities. Platform companies also fund research at universities and create a dependency of research institutions, by awarding big research grants and technical infrastructure to them.

It is also well established that platform companies spend a lot of energy setting up tax avoidance schemes and hiding their assets from taxation. Figures 1 and 2 show the average taxes that the big platform companies paid in 2010-19 in the United States. On average, these companies paid no more than 15% on their declared profit in this period. This tax rate is considerably lower than the corporate tax rate of 35% and the reduced corporate tax rate of 21%, imposed after the Tax Cuts and Jobs Act in 2017 (Fair Tax Mark 2019). This gap is primarily explained by profits shifted to tax havens. In this context, Ireland plays a prominent role in tax avoidance, as most platform companies, such as Google or Facebook, have moved their European headquarters there. According to Tørsløv et al., Ireland charges an effective corporate tax rate of 4%, explaining why more than 100 billion dollars in profits have been

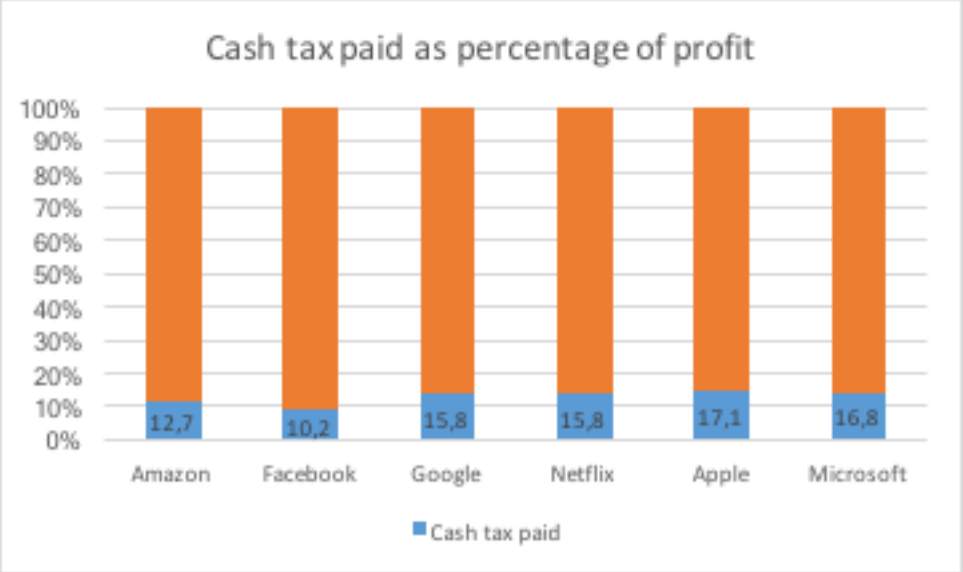
shifted to the island (Tørsløv et al. 2018). The difference in cash tax paid by these companies and the expected headline tax rate over the period of 2010-2019 was over 155 billion US dollars, according to a report by Fair Tax Mark (Fair Tax Mark 2019). By avoiding tax payments at such a large rate, these platform companies not only harm the government, which needs tax incomes for public investments, but also engage in anticompetitive behaviour with small and medium-sized companies, who have to pay a higher tax rate on their profits.

Figure 1: Cash tax paid by major tech firms, 2010-2019



Source: Fair Tax Mark 2019

Figure 2: Cash tax paid by major tech firms as percentage of profit, 2010-2019



Source: Fair Tax Mark 2019

Finally, platform companies have a particularly hostile approach towards unions and have employed a number of strategies to avoid unionization. For instance, Amazon is well known for employing a variety of union busting strategies, such as monitoring closed Facebook groups by independent contractors, hiring intelligence analysts to track labour organizing efforts, or investing in surveillance software that allows them to better control the warehouse

workforce (Palmer, 2020). Employees trying to organize the workforce into unions are often laid off immediately in order to discourage further organizing efforts. Similarly, companies such as Uber and Doordash try to prevent their workers from organizing into unions and are involved in countless lawsuits with labour unions regarding the employment status classification of their workers (Collier et al. 2018). The hostile approach of platforms towards unions and collective bargaining is a significant threat, particularly to European countries with a strong tradition of social partnership, as it challenges the core of the industrial relations model in these countries (Jesnes & Oppegaard 2020).

3. Implications for the study of the digital economy

There are three key battlefields, in which the future of the digital economy is currently being fought. Analysing these battles can guide our way of thinking about the institutional base of the digital economy: the battle over growth, the battle over regulation of the tech industry and the battle over labour standards.

3.1 The battle over growth

A central characteristic of the digital economy are the strong growth rates in comparison to the overall economy. Varying with the concrete definition of what constitutes the digital economy, its size as share of global GDP is estimated at between 4.5% and 15.5% (UNCTAD 2019). Growth is particularly pronounced in the case of platform companies. The value of platform firms, with a market capitalization of over 100 million dollars, increased by 67% to 7 trillion dollars between 2015 and 2017. The growth of the digital economy has outstripped the growth of the total economy for years now and, in some countries, has been more than twice as high. In most estimations, the impact of the Covid-19 pandemic has not yet been taken into account and is expected to further boost the digital economy due to online shopping, working from home and the pandemic-induced recession of the total economy. Amazon is, for instance, one of the biggest winners of the pandemic, increasing its revenue between the first quarter and the third quarter in 2020 by 27%, from 75.5 billion US dollars to

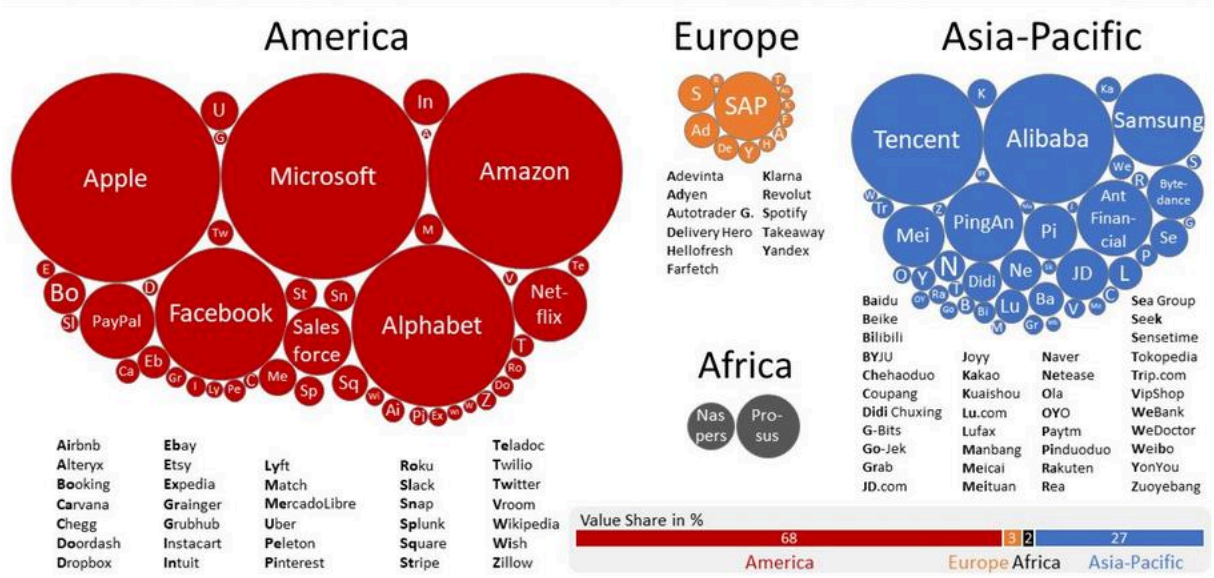
96.1 billion US dollars. Its profit more than doubled over the same time period, from 2.5 to 6.4 billion US dollars (Statista 2020a).

However, there are differences in growth rates, particularly in the platform firms of North America and Asia, on the one hand, and Europe, on the other. Due to the prevalence of infrastructure platforms, the digital economy has particularly taken off in North America and Asia (Barefoot et al. 2018; Statista 2019). Two factors that explain its greater prevalence in these regions are (1) more accessible venture capital funding and (2) state-coordination, both of which are missing in Europe. In 2018, Europe captured 21 billion dollars in venture capital funding compared to 81 billion dollars in Asia. Venture capital investment captured in the Americas was five times higher, at 102 billion US dollars (Statista 2019). The availability and amount of venture capital funding is one of the main reasons why there are very few large platform firms in Europe. Another reason is greater state coordination in scaling up platforms. Due to the preferential treatment of selected platforms, such as Alibaba or Tencent, the state has helped companies to quasi monopoly status and established them as global players. These two mechanisms, which contribute to the strong growth rates of platforms, however, has just begun to be investigated. The venture capital funding model is not exclusively associated with platform firms, but was already applied in the first internet boom in the 90s, for instance. The role of large venture capital investors and the sustainability of platform business models that focus only on growth at the expense of profitability is also a recent but growing research field. Venture capital funds pool an unprecedented amount of capital and are involved in ever-increasing investments, reflected in particular by Softbank's Visionfund, which has a size of 100 billion dollars and is the largest pool of private capital ever raised (Statista 2020a). The role of institutional investors has also increased significantly over the last few decades. From a political economy perspective, this raises the question of systemic risks and anticompetitive behaviour, sparked by common ownership and the pooling of large, private capital (Azar et al. 2018; Braun 2020.). Similarly, the role of state coordination in facilitating platform business models, apart from a rather anticompetitive and autocratic approach, as applied in China, is of the utmost importance from a political economy perspective.

The ecosystem of the digital infrastructure is dominated by North American and Asian platform firms, as can be seen in figure 3. Out of the 100 largest platform companies as measured by market capitalization, the value share of European platform companies is only 2%, whereas North American and Asian platform companies account for 68% and 27% respectively. The battle over who defines the infrastructure of the digital economy is thus between North American and Asian platforms. In terms of digital infrastructure, only the German SAP might be able to occupy a niche in the infrastructure market on business operating software. Instead, European companies have more potential to compete with North American and Asian firms in the sectoral platform market. European platforms can play a significant role in the future, particularly in sectoral platforms in the global B2B market, which is assumed to be roughly six times larger than the B2C market and, in contrast, not yet dominated by single platform firms (Statista, 2019a). Despite the great potential of B2B platforms, only very few studies have analysed their geographical dispersion (Kenney & Zysman 2020). In this context, Krell et al (2020) showed, for instance, that the German B2B platform market is characterized by a great geographical dispersion between former East and West Germany.

Only a limited number of small and medium-sized companies set up sectoral B2B platforms, due to high up-front investment costs, which explains why most successful B2B platforms are set up in ventures. In order to better analyse the interaction between different political economies and the dissemination of sectoral platforms, we need a better understanding of where and in which markets platforms are concentrated, how they affect local economic activity and their geography of value creation.

Figure 3: Geographical distribution of the top 100 platform companies



Source: Hosseini, H. & Schmidt, H. (2020)

The growth of the digital economy in countries outside the United States or China will focus on sectoral platforms, which build on the digital infrastructure provided by the large tech firms. Key for the transformation of the digital economy is the roll-out of sectoral platforms within existing sectors and industries. Here, the diversity of sectoral platforms can be an advantage for finding specific solutions for adjusting established industries to new business models. These include B2B platforms, which facilitate the restructuring of services and products. They are most likely to be country specific and specific to growth regimes. There will be different sectoral platformization trajectories in different industries. For instance, in Germany, Industry 4.0 will incorporate sectoral platforms into the German manufacturing system, leading to different patterns of flexible specialization than elsewhere (Butollo 2020). In countries such as Sweden, which has already successfully transitioned to become a knowledge-based economy, platforms in the ICT sector are more likely to emerge (Steen et al. 2019). The application and integration of sectoral platforms in industries is shaped by existing growth regimes, government regulation and the availability of research and knowledge of digital tools in specific contexts. The higher levels of financialization and the prevalence of ICT could facilitate the dissemination of sectoral platforms in dynamic services, export-led growth regimes and finance-based, domestic, demand-led growth regimes (Hassel et al., 2020). Publicly-financed, domestic, demand-led growth regimes, on the other hand, could substantially impede the scaling of sectoral platforms, due to low financialization

and a weaker ICT sector. In the past, the literature on growth models has focused primarily on a demand-side perspective with an emphasis on private consumption, public spending or net export. With the dissemination of platforms, the supply-side perspective gains importance and factors such as market access, access to capital or labour costs are important factors for deciding where sectoral platforms will succeed.

One example of how sectoral platforms fare differently in different contexts is the case of Uber in the European Union. After the ECJ ruled that Uber is a transportation rather than a technology company and therefore became subject to member state regulations, EU member states have adopted a whole range of different responses, ranging from banning Uber at the national or local level to full acceptance of the Uber business model (Thelen 2018). The different responses do not necessarily follow VoC expectations, as the Nordic countries have a much more relaxed approach towards Uber compared to France, for instance (Thelen 2018). Instead, the regulatory responses are influenced by a variety of factors, including the strength of taxi associations, the prevalence of self-employment or access to social protection for self-employed workers. The different regulatory approaches by governments will shape the institutional trajectory of the ridesharing and transportation industries in these countries and have feedback effects for the development of these sectoral platforms. The struggle over the norms and regulations will be an uphill battle in every industry that is exposed to sectoral platforms. Each country and sector will find their own solutions to the extent in which they will allow the platformization of particular sectors and what this process will look like.

3.2 Regulating infrastructure platforms

The rise of the digital economy triggers responses by regulators towards tech companies. In the US, the EU and big member states, legislative processes are in place to draft new regulations. Contestation is part of setting the rules and comes from policymakers and courts. Beginning with the big antitrust case against Microsoft in 2001, there have been continuous efforts to finds ways of limiting the rising corporate power of tech companies without stifling the radical innovation they promise and the services they deliver to businesses and consumers. Over the last 20 years, the business practices of tech companies

and applications to industries have played out in three areas in particular: the discussion about the regulation of infrastructure platforms, the role of employment standards and rights with regard to independent contractors, and the emerging regulation of sectoral platforms.

The emergence of infrastructure platforms, particularly in the United States over the last 20 years, has been substantially aided by more favourable antitrust law than in the European Union. Even though American competition law remains much more developed in terms of case law and has influenced European competition law, important differences remain (Bradford et al. 2019). These differences, which also have repercussions on the development and flourishing of infrastructure platforms, can best be illustrated by contrasting a substantial and a procedural dimension.

In the United States, since the 1980s, there has been a shift in antitrust regulation from economic structuralism to a consumer welfare principle, promoted by the Chicago School (Khan 2016). This shift has manifested itself in a narrower concept of barriers to market entry and consumer prices being the most important metric for the analysis of potential anticompetitive behaviour. Defining market entry barriers much more narrowly has led to a decline in successful antitrust lawsuits, as anticompetitive behaviour, such as predatory pricing, was rarely considered. Antitrust violations have only been found in horizontal mergers, whereas vertical mergers were not considered harmful for competition (Khan 2016). This negligence of antitrust violations in the case of vertical integration has especially benefitted large platform companies, such as Amazon or Google, who have expanded their business across a variety of product lines. In addition to narrowly defined market entry barriers, the focus on consumer prices entailed that no antitrust violations have been found in mergers, such as that between Facebook and WhatsApp, due to the fact that the service was still provided for free. The application of antitrust law since the 1980s is being increasingly scrutinized, as it underappreciates the risk of predatory pricing and vertical integration (Khan 2016). There are concerns, which are particularly heightened by platforms because predatory pricing is an important factor in their expansion strategy and because they emphasize growth over profit. The large platform firms, in particular, operate infrastructures across different market segments, which are vertically integrated.

In contrast to the United States, the European Union considers a greater variety of goals in evaluating competition violations, including the integration of the single market, regional development, employment and the protection of SMEs. In this context, Bradford et al. (2019) suggest that, unlike in the United States, European competition law generally reflects lower levels of faith in self-correcting markets and a higher acceptance of state intervention. A major difference between both jurisdictions is that European competition law not only considers the rights of consumers but also that of other businesses. Thus, even if consumers

are not harmed, a competition violation can be found on the basis of the infringement of other businesses' freedom to compete.

A key example, where competition law application between the United States and the European Union makes difference in practice, is predatory pricing. Whereas in the United States it must be shown that a firm accused of predatory pricing did not ultimately recoup their loss and make a profit, in the European Union it is sufficient to show that they harmed competitors (Möschel 2007).

Apart from substantial differences, there are also considerable procedural differences in competition law between the United States and the European Union. In the European Union, antitrust law is, in most cases, enforced through public enforcement, whereas in the United States, private claims plays a greater role and exceed public enforcement (Juska 2017). This difference can largely be explained by procedural differences between both jurisdictions, which makes it harder for private claims to be brought to court in the European Union. A further consequence of the discrepancy between public and private enforcement is that competition law in the European Union is primarily shaped by administrative agencies, whereas in the United States, it is influenced and developed much more by case law.

Reflecting the substantial differences in competition law, regulation in the European Union is considered to be stricter, as a lower threshold for dominant positions and abuse of dominance are applied. These differences in enforcement play out in the case of tech companies in particular, which have been fined in the European Union yet cleared in the United States for equivalent conduct in the past (Gutierrez & Phillipon 2018).

Despite significant substantive and procedural differences in competition law, the regulation of platforms is becoming an increasingly important concern in both jurisdictions. In the United States, a House Judiciary Committee antitrust report concludes, for instance, with the recommendation to ban companies from both providing a platform and competing on the platform, effectively breaking up most of the big tech companies. It moreover recommends creating new non-discrimination obligations for platforms, abandoning the narrow consumer welfare principles towards antitrust violations for a broader standard, aiming to protect all stakeholders and to control acquisitions by major tech companies that could be seen to be anticompetitive (Nadler et al. 2020). Abandoning the consumer welfare principle would constitute a substantial change in competition law and open the debate about which goals should guide antitrust cases in the future. These could include non-economic objectives, such as the quality of products, consumer choice, or the diversity of products, which are already taken into account in the European Union. Wu (2012) argues that the protection of competition is an objective in itself and should replace the consumer welfare principle. Other

critics of the current status of antitrust law go even further and propose breaking up big tech companies or a public ownership model (Taplin 2018). Similarly, Tepper & Hearn (2018) advocate a much fiercer stance on mergers, by proposing that the number and diversity of firms in a market as a desirable goal ought to be achieved by competition law. Tirole (2017) proposes a more nuanced position by strengthening market contestability and reducing market entry barriers (Van Dorpe 2021).

A serious practical concern in applying these competition frameworks is the fast pace of the digital economy, which makes interventions very challenging. Most competition laws pursue an ex-post evaluation and allow an intervention only after an antitrust violation has been found. Due to the length of court proceedings and the companies' financial power to sustain lengthy lawsuits, the market interventions by competition authorities often takes too long (Ducci 2020). Against this background, the German parliament passed an amendment to its competition act that ought to limit platform companies' ability to appeal and transfer any objections directly to the federal court in order to reduce the length of court proceedings. At the centre of the regulation debate lies the question of finding the right balance between ex-post and ex-ante regulation. Particularly in the European Union, an ex-ante antitrust framework has gained momentum. It is not only Germany and France that are currently pushing for ex-ante regulation of anti-trust cases, but also the European Commission, with its release of the Digital Services Act and the Digital Market Act, two legislative proposals that are premised on an ex-ante regulatory approach (Kayali & Scott 2021; European Commission 2020a). In particular, the Commission has formulated a set of obligations that so-called gatekeeper platforms have to abide by. This interventionist approach of ex-ante regulation in the European Union stands in contrast to a competition law framework in the United States that follows a less rigid approach and reflects on the overarching question of which regulation framework prevails in a globalized digital economy.

The battle over the prevalence of national regulation concerning the tech industry between the European Union, on the one hand, and the Anglo-Saxon world, on the other hand, is a central topic for comparative political economy. A race to the bottom in light of mounting international competition is not necessarily inevitable. Instead, increasing concerns over privacy and market concentration could also cause a regulatory race to the top (Ducci 2020). A first battlefield, where the conflict between upgrading and downgrading of regulatory standards plays out, is the question of data protection. In 2018, the European Union implemented the GDPR law, which sets a higher regulatory standard in data protection. Although the regulatory battle is in full swing, a similar law in California (CCPA), implemented in 2020, indicates that a further downgrading, at least in the case of data protection regulation, is not likely (Voss & Houser 2019). An area where similar contentions have already played out and which can serve as an orientation for the ongoing dispute over regulation

standards is environmental regulation. David Vogel (1995) showed, in this context, that increasing trade liberalization did not result in a downgrading of regulation, as stricter regulations raised market entry barriers by enhancing product standards and ultimately gave complying firms a competitive advantage. Although it remains to be seen in what sense a similar dynamic will unfold in the regulatory battle over the digital economy, an inevitable downgrading of regulation standards is questionable.

3.3 Employment and labour standards

The third big battlefield in Western countries is the legal status of independent contractors and employer responsibility. Even though the gig economy and gig workers do not have a big share of the labour market, but hover around 1-2% in most countries, the rules and regulations for independent contractors are important for some parts of sectoral platforms, in particular in the fields of logistics and transportation. Platform firms, such as Uber, entered new markets by rolling out their services and ignoring regulatory requirements such as national labour laws. This approach was particularly successful in the United States and the United Kingdom. Collier et al (2018) argue, in this context, that Uber not only deregulated but also disrupted the market by creating a dual regulatory regime, applying different regulations to the company than to local taxi providers. An argument, which is shared by Smith (2018), who pointed to political crises created by Uber and Lyft in the United States leading to outright disruption rather than partial deregulation. These labour-related platform firms achieved deregulation through different channels. A central way to disrupt existing regulation is for these companies to immediately litigate any regulation that is to their disadvantage. Being equipped with great sums of venture capital enables them to engage in long and costly court battles (Dubal 2017; Collier et al. 2018). Moreover, they exploit jurisdictional fragmentation as another way to legitimise their activities. This played out in the case of Uber, where the platform achieved deregulation despite well-organized, local taxi providers, who were also connected to local politics (Thelen 2018). In the highly fragmented US context, Uber caused competition across cities and regulators. A third way to legitimize their services is to act as regulatory entrepreneurs, a term coined by Pollmann and Barry (2017). According to the authors, it is based on tactics such as (1) operating in legal grey areas (2) being too big to ban and (3) mobilizing users for political support.

After successfully deregulating labour standards in the beginning, platform firms started to face increasingly more obstacles, as the example of Uber illustrates. In Germany, a country with a denser organizational landscape, strongly organized taxi associations organized a quick response, resulting in a ban of Uber (Thelen 2018). Similarly, in the Netherlands, Uber

was too confrontational and employed different institutional strategies in particular but, by applying them simultaneously, prevented becoming part of a political process of co-creation that could lead to changes in taxi law (Collier et al. 2018; Uzunca et al. 2018). Uber was largely successful in legitimizing their activities in Sweden, by making small concessions on taxes but not on employment regulations (cf. Thelen 2018; Jesnes & Oppegaard 2020). In Denmark, however, the company failed to prevent stricter regulations and left the Danish market altogether (cf. De Groen et al. 2018). In summary, there is a tentative shift towards a stricter regulation of employment standards on labour platforms. The debate on regulation primarily concerns the employment status of independent contractors and access to social protection schemes. Central to the question of the employment status of independent contractors is the subordination principle (Aloisi 2020). Only if independent contractors are truly self-employed and able to carry out their work independently, which is subject to countless lawsuits across Western countries, is their employment status ruled to be legal. The application of the subordination principle to these new forms of work is at the heart of lawsuits and employment legislation. A common pattern on how subordination is decided, in the context of work organized and controlled by apps, is not yet visible and ranges from rejection, as in the case of Deliveroo in the United Kingdom, to approval, as recent successful lawsuits regarding the same company in France have shown (Palli 2020). The issue of bogus self-employment is further aggravated in countries where access to social protection schemes for self-employed workers is limited. Despite a tentative shift towards the stricter regulation of independent contracting in the European countries, regulation in the United States has developed in a different direction. In the recent attempt by Californian lawmakers to regulate the use of independent contractors on work platforms, the ridesharing platform companies hit back by initiating a referendum on the regulation. They spent about $200 million in advertising and campaigns and ultimately won the referendum. The regulation of employment in the digital economy has, however, not been decided.

Employment in the digital economy will, however, not be regulated in a dichotomy between either banning or allowing independent contracting. Instead, the regulatory approaches discussed and pursued include a much wider range of options, encompassing the introduction of a third employment category between dependent and independent work, the extension of social protection for self-employed workers, and the reversal of proof in reclassifying platform workers (Aloisi 2020; Denkfabrik 2020; Naumann 2020).

4. Conclusion

After several decades of an increasing use of digital tools and the establishment of a digital infrastructure, we now see a transformation towards digital economies worldwide. The potential of the digital economy lies in the interconnectedness of digital instruments and services. As the internet has become a virtual landscape, in which services are traded continuously at rapid speed with almost no friction, the development and administration of the underlying digital infrastructure has become of key importance. Instant information combined with on-the-spot market trading in the virtual world allows for rapid communication, the brokerage of contacts and the dissemination of information. These tools allow for a better management of supply chains, which includes reshoring to developed economies at the detriment of developing countries. The future of supply chains, comparative advantages and growth depend on the dissemination of digital instruments and platforms, not only in the B2C segments but also in the value chains of other industries.

As we have established in this paper, the current trajectory of digital transformation is dominated by big tech companies because these companies both provide and control the digital infrastructure. Infrastructure providers facilitate the application software and platforms, driving corporate restructuring and new value chains and value capture in established industries. They structure digital services, set the rules for market participants and enforce these self-made rules all at the same time. Currently, all these decisions are taken by private businesses in a largely unregulated setting. The big tech firms, who are the providers of these services, shape the organization and provision of digital services in their favour: they control access to those services, use the user information for their own business models and aim to monopolize knowledge and development.

This construction of the digital economy has emerged over the last couple of decades. This does not mean that the existing construction of actors and processes will continue in the future. Different regulatory and business models are possible, which can potentially avoid monopolies of power and unfair competition in digital markets. However, in order to make the digital economy a fairer place, regulators will have to step up and introduce and enforce the regulation of digital services. As the examples in the introduction show, we can now see the evolution of regulation in key areas of the digital economy, as regulators in the US and Europe try to come to terms with the challenges of the tech industry.

We highlighted three battlefields that will decide the future of the digital economy. Firstly, the immersion of digital infrastructure in established industries will decide the fate of companies' competitiveness and, by the same token, the welfare of political economies

around the world. How sectoral platforms and industry specific digital tools will shape new value chains and value capture will be decisive for geopolitical development. Second, the regulation of the tech companies themselves will be of crucial importance. Here the role of regulation in the US and the EU as well as in member states will set new standards. The legislative proposals of the EU (DMA and DSA) are key examples of how the tech industry might be regulated. Thirdly, the regulation of employment in the gig economy will limit the precarious employment relationships on platforms. For the wellbeing of workers, this will have important signalling effects for other sectors.

Ultimately, we are not pessimistic or dystopian with regard to the digital economy. While challenges remain, there has been a lot of progress towards the need for regulation. As countries engage with the transformation and governments see the need for better regulation, there is a lot of room for change. In the EU in particular, where none of the tech companies reside, the potential for regulators is actually quite high.

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